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09/622,401	08/16/2000	Hans Goran Evald Martin	P/3658-10	3531

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EXAMINER	
LEE, SHUN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/622,401	MARTIN ET AL.
	Examiner	Art Unit
	Shun Lee	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2002 & 19 June 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *55-101* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *55-101* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *17 June 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *7 & 10* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The papers filed on 19 June 2002 (certificate of mailing dated 13 June 2002) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS
ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents.

If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

2. The information disclosure statement filed 19 June 2002 fails to comply with 37 CFR 1.97(c) because it lacks the fee set forth in 37 CFR 1.17(p).

Drawings

3. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 17 June 2002 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Objections

4. Claims 55, 56, 61, 63, 81, and 100 are objected to because of the following informalities:

(a) in claim 55, "an angle of incidence" on lines 11-12 and again on lines 13-14 is indefinite and can lead to misinterpretation (if the elements are different, the former should be identified as --a first angle of incidence-- and the later should be identified as --a second angle of incidence--);

(b) "components" on line 19 of claim 55 and again on line 2 of claim 56 is indefinite and can lead to misinterpretation (if the elements are different, the former should be identified as --first components-- and the later should be identified as --second components--);

(c) "a topographical structure" on line 9 of claim 55 and again on line 3 of claim 61 is indefinite and can lead to misinterpretation (if the elements are different, the former should be identified as --a first topographical structure-- and the later should be identified as --a second topographical structure--);

(d) "a cover" on line 17 of claim 55 and again on line 1 of claim 63 is indefinite and can lead to misinterpretation (if both elements are the same, the later should be identified as --said cover--);

(e) in claim 81, "that" on line 5 should probably be --than--; and

(f) in claim 100, "the first of" on line 1 should probably be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 80, 83, 87, and 96 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 80 recites the limitation "a second cover part" which was not described in the specification.

Claim 83 recites the limitation "the base structure on which the topographical structure is formed is applied to a surface of the cover". The specification fails to describe how the base structure is applied to a surface of the cover (especially since the base structure and the cover are discrete components).

The specification discloses (paragraph beginning at line 17 of pg. 31) that the heat reflecting layer is comprised of the reflective metal layers M1, M2. However, claim 96 recites the limitation "a metal layer" which was not described in the specification.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 67-78 and 88-97 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 67 recites the limitation "the first angle of incidence" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 67 recites the limitation "the second angle of incidence" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim.

Claim 70 recites the limitation "the first angle of incidence" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 70 recites the limitation "the second angle of incidence" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 88 recites the limitation "the first angle of application" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

Claim 88 recites the limitation "the second angle of application" in lines 9-10. There is insufficient antecedent basis for this limitation in the claim.

Claim 91 recites the limitation "the first angle of application" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 91 recites the limitation "the second angle of application" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 56 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: an electromagnetic wave receiving device to other elements (*e.g.*, the detector; "electromagnetic wave receiving device" should probably be --the detector--).

10. Claims 79-101 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: a thermal element to other elements (*e.g.*, the detector; "a thermal element" should probably be --a thermal element of the detector--).

11. Claim 80 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such

omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: an electromagnetic wave receiving device to other elements (*e.g.*, the detector; "electromagnetic wave receiving device" should probably be --the detector--) and a second cover part to other elements.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 55-61, 63-73, 76-94, and 97-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters *et al.* (US 5,550,375) in view of Baxter (US 4,111,717), Dschen (DE 41 10 653 A1), and Matarese (US 3,908,263).

In regard to claims **79**, **81**, and **82** in so far as understood, Peters *et al.* disclose a detector using a gas sensor, intended for detecting electromagnetic waves passing through a gas cell:

(a) said gas cell comprising an enclosure, defining a gas cell cavity (*i.e.*, free space or cuvette compartment; column 2, lines 26-30), for enclosing a volume of gas to be evaluated;

(b) a surface within said enclosure is applied with at least one metal layer for forming a highly reflective surface with regard to electromagnetic waves (column 2, lines 31-35);

(c) an electrically non-conductive base structure (column 2, lines 36-57) also defining the enclosure and having retaining structures or alignment structures (*i.e.*, topographical structures; column 2, lines 36-42) for the radiation receiver such as thermopile, pyroelectric receiver, or bolometer (*i.e.*, thermal element; column 3, lines 23-26) in the cavity, inherent in a thermopile is a first and a second electrically conductive metal layer comprised of respective metals with the metals of the layers acting together at the discrete surface parts where they overlap to form a plurality of hot and cold thermocouple junctions as is well known in the art (For example, Baxter teaches (column 2, line 65 to column 3, line 40) it is well known in the art that thermopiles comprise of a plurality of hot and cold thermocouple junctions formed by the joining of two electrical conductors of different composition such as for example chromium alloy or gold. As another

example, Dschen teaches (Figs. 1, 2, 3a-3c) that a plurality of thermoelectric junctions (3, 4) can be formed by the application of two different layers (1, 2));

(d) the enclosure further comprising a cover (*i.e.*, cover plate; column 2, lines 26-30), that encloses the cavity and the part of the base structure in the cavity, and that exposes the retaining structures or alignment structures (*i.e.*, topographical structures); and

(e) the base structure having an outside area outside the retaining structures or alignment structures (*i.e.*, topographical structures), and said outside area carrying a circuit arrangement and components associated with the detector (column 2, lines 36-57).

The apparatus of Peters *et al.* lacks that the first and second conductive metal layers are located on the topographical structure by application at a first and second incidence angle, respectively, wherein the first and second incidence angles are different and other than 90°. Matarese teaches (Fig. 7; column 1, lines 31-60) to apply a metal layer to a surface structure at an angle of incidence other than 90° (*i.e.*, grazing angle) in order to simply and quickly form interdigitated electrodes (*i.e.*, electrically conductive metal layers). Therefore, it would have been obvious to one having ordinary skill that the thermopile in the apparatus of Peters *et al.* can be simply and quickly formed by applying electrically conductive metal layers to a surface structure (*i.e.*, retaining structure) at grazing angles as taught by Matarese.

In regard to claims **55**, **57**, and **58**, the method steps are implicit for the modified apparatus of Peters *et al.* since the structure is the same as the applicant's apparatus of claims 79, 81, and 82 above.

In regard to claim **56** (which is dependent on claim 55 in so far as understood) and claim **80** (which is dependent on claim 79 in so far as understood), Peters *et al.* also disclose (column 2, lines 36-57) that radiation source (*i.e.*, an electromagnetic wave generating device) and the radiation receiver (*i.e.*, thermal element or electromagnetic receiving device) can be connected to the shaped part via a waveguide (*i.e.*, arranged adjacent and outside) or is integrated directly into (*i.e.*, enclosed by) the shaped part and is thus disposed for generating electromagnetic waves into and receiving electromagnetic waves from the enclosure, respectively. Peters *et al.* further disclose (column 2, lines 36-57) that the base structure have an outside area (*i.e.*, second cover part) outside the retaining structures or alignment structures (*i.e.*, topographical structures), and the outside area carrying the circuit arrangements for the conductive metal layers.

In regard to claim **59** which is dependent on claim 55, Peters *et al.* also disclose (column 2, lines 53-57) that there is a limited surface region of the base structure, which is less than the entire surface region of the base structure; the method further comprising applying said detector (*i.e.*, IR radiation receiver) on the limited surface region, and applying required electric conductors or electric circuits (*i.e.*, electronic elements) to the thermal element on the limited surface region.

In regard to claims **60** and **61** which are dependent on claim 55, Peters *et al.* also disclose (column 2, lines 36-57; column 3, lines 45-58) that the one-piece shaped part has been produced by a LIGA process (*i.e.*, lithographic etching, electroplating, and casting).

In regard to claim **63** which is dependent on claim 55, Peters *et al.* also disclose (column 2, lines 1-15) that the gas cell cavity is enclosed with a cover, the method further comprising applying parts of the detector on said cover and inside the cavity.

In regard to claim **64** (which is dependent on claim 55) and claim **85** (which is dependent on claim 79 in so far as understood), Peters *et al.* also disclose (column 2, lines 31-35) that the surface of the cavity should be coated with metal layer having good reflectivity in the spectral range used (*i.e.*, IR radiation). The method and apparatus of Peters *et al.* lacks that the interior of the cavity is coated with the same metal as the topographical structure of the detector at the same time. Baxter teaches (column 3, lines 17-31) that a thermopile is coated with a metal that serves the dual purpose of forming a cold thermocouple junction and a heat (*i.e.*, IR radiation) reflector. Therefore, it would have been obvious to one having ordinary skill to coat the cavity surface with the same metal used to form the thermocouple junctions of the thermopile in the method and apparatus of Peters *et al.* in order to obtain a cavity surface having good reflectivity in the spectral range used (*i.e.*, IR radiation).

In regard to claim **65** (which is dependent on claim 55) and claim **86** (which is dependent on claim 79 in so far as understood), Peters *et al.* also disclose (column 2, lines 50-57) electronic elements for amplifying the detector signals. Inherent in detector

signal amplifying electronic elements are detector connection pads in order to provide electric conductive paths for transmitting the detector signals from the metal layers of the thermopile detector to the amplifying electronic elements for amplification and that the topographical structure is suitable (*i.e.*, is shaped) for providing connection pads to the detector, electric conductive paths and circuitry to the metal layers.

In regard to claim **66** (which is dependent on claim 63) and claim **87** (which is dependent on claim 83 in so far as understood), Peters *et al.* also disclose (column 2, lines 50-57) an electric conductor path and electric circuits to the detector which are formed in the cover (*i.e.*, substrate).

In regard to claims **67** and **71-73** (which are dependent on claim 57 in so far as understood) and claims **88** and **92-94** (which are dependent on claim 81 in so far as understood), the apparatus of Peters *et al.* lacks a detailed description of the thermopile as an array (*i.e.*, n columns by m ridges) of conductive ridges (having a first thermocouple junction on the ridge upper surface and a second thermocouple junction at an intermediate surface located between mutually adjacent conductive ridges) with each conductive ridge electrically series interconnected. Dschen teaches (abstract; Fig. 1) an array (*i.e.*, n columns by m ridges) of thermocouple junctions (*i.e.*, a thermopile) having a first thermocouple junction on the ridge upper surface and a second thermocouple junction at an intermediate surface located between mutually adjacent conductive ridges. Therefore, it would have been obvious to one having ordinary skill that the thermopile in the apparatus of Peters *et al.* is formed as an array (*i.e.*, n columns by m ridges) of conductive ridges (having a first thermocouple junction on the

ridge upper surface and a second thermocouple junction at an intermediate surface located between mutually adjacent conductive ridges) with each conductive ridge electrically series interconnected as is known in the art.

In regard to claim **68** (which is dependent on claim 67 in so far as understood) and claim **89** (which is dependent on claim 88 in so far as understood), the method and apparatus of Peters *et al.* lacks that the topographical structure including the ridges are positioned relative to incident electromagnetic waves so that the waves irradiate the upper surfaces of the ridges but the ridges shadow the intermediate conductive surfaces against incident electromagnetic waves. Baxter teaches (column 3, lines 46-55) to provide a reflective area overlying a portion of the cold junctions in order to reduce the influence of stray radiation on the cold junctions. Therefore, it would have been obvious to one having ordinary skill to provide a reflective area (*e.g.*, hot junctions) overlying a portion of the cold junctions on intermediate conductive surfaces in the method and apparatus of Peters *et al.*, in order to reduce the influence of stray radiation on the cold junctions (*i.e.*, the cold junctions will be in the shadow of the hot junctions on conductive ridges).

In regard to claims **69** and **70** (which are dependent on claim 67 in so far as understood) and claims **90** and **91** (which are dependent on claim 88 in so far as understood), it is inherent in the thermopile of Peters *et al.* that electrically insulated surface sections (without both said first and said second metal layers) are formed at said intermediate conductive surfaces located at surface sections surrounding and adjacent to the thermopile of said base structure since it is clear that the thermopile is of

a finite extent and located at one region in order to observe one or a few wavelengths (see column 3, lines 28-31).

In regard to claim **76** (which is dependent on claim 68 in so far as understood) and claim **97** (which is dependent on claim 89 in so far as understood), it is inherent in the method and apparatus of Peters *et al.* that the first metal has a first reflection coefficient with respect to the electromagnetic waves and the second metal has a second reflection coefficient with respect to the electromagnetic waves. The method and apparatus of Peters *et al.* lacks that parts of the detector are positioned relative to the incident electromagnetic waves and the metal layers and the conductive ridges are so positioned that the metal having the lowest of the first and second reflection coefficients covers the side surfaces of the ridges that face the incident electromagnetic waves. Baxter teaches (column 3, lines 46-55) to provide a reflective area (*e.g.*, gold) overlying a portion of the cold junctions in order to reduce the influence of stray radiation on the cold junctions. It should be noted that by definition, a material with a low reflection coefficient has less reflected radiation than a material with a higher reflection coefficient. It should also be noted that stray radiation comprises of reflected incident radiation. Therefore, it would have been obvious to one having ordinary skill to position the surface of said detector relative to incident electromagnetic waves in the method and apparatus of Peters *et al.* so as to provide a reflective area (*e.g.*, the first metal forming the cold junction with a lower reflection coefficient than the second metal forming the cold junction) overlying a portion of the cold junctions, in order to reduce the influence of stray radiation on the cold junctions.

In regard to claim **77** (which is dependent on claim 67 in so far as understood) and claim **98** (which is dependent on claim 81 in so far as understood), it is inherent in the thermopile in the method and apparatus of Peters *et al.* that the metals of the first and second metal layers are different to obtain a thermoelectric effect between the first and second metal layers.

In regard to claim **78** (which is dependent on claim 76 in so far as understood) and claim **99** (which is dependent on claim 98 in so far as understood), the method and apparatus of Peters *et al.* lacks that the first and second metal layers respectively comprise gold covering chromium. Baxter teaches (column 2, line 65 to column 3, line 40) it is well known in the art that thermopiles comprise of a plurality of hot and cold thermocouple junctions formed by the joining of two electrical conductors of different composition such as for example chromium alloy or gold. Therefore, it would have been obvious to one having ordinary skill to that the thermopile in the method and apparatus of Peters *et al.* comprise of different types of conductors such as gold and chromium.

In regard to claim **83** which is dependent on claim 79 in so far as understood, Peters *et al.* also disclose (column 2, lines 1-15) that the base structure on which the retaining structures or alignment structures (*i.e.*, topographical structures) is formed is applied to the cover.

In regard to claim **84** which is dependent on claim 79 in so far as understood, Peters *et al.* also disclose (column 2, lines 1-15) that the base structure on which the retaining structures or alignment structures (*i.e.*, topographical structures) is formed is

an integral part, and the detector associated surface parts form an integral part of the inner surface of the cavity (*i.e.*, in a sealing manner).

In regard to claim **100** which is dependent on claim 79 in so far as understood, Peters *et al.* also disclose (column 2, lines 53-57; column 3, lines 28-33) that the first of the base structure includes a surface section for receiving at least two of the detectors (*i.e.*, rows of radiation receivers).

In regard to claim **101** which is dependent on claim 79 in so far as understood, Peters *et al.* also disclose (column 2, lines 36-42; column 3, lines 28-33) that the cover includes a surface for receiving at least one of the detectors (*i.e.*, one or a few radiation receivers).

15. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peters *et al.* (US 5,550,375) in view of Baxter (US 4,111,717), Dschen (DE 41 10 653 A1), and Matarese (US 3,908,263) as applied to claims 67 and 88 above, and further in view of Larsson (Micro Structure Workshop 1996, pp. 5.1-5.8).

In regard to claim **62** which is dependent on claim 55, the modified method of Peters *et al.* lacks forming the mold for the shaping operation by mechanically working a substrate, wherein the configuration of the substrate is complementary with respect to the topographical structure to be formed. Microreplication techniques are known in the art. For example, Larsson teaches (Fig. 1; sections on Microreplication technology and Micromachining of the master) to choose the type of master fabrication technique (*e.g.*, micromachining instead of LIGA which is expensive) depending on application, costs, development time and needed accuracy. Therefore, it would have been obvious to one

having ordinary skill to use micromachining in the modified method of Peters *et al.*, in order to use a less expensive master fabrication technique.

16. Claims 74, 75, 95, and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters *et al.* (US 5,550,375) in view of Baxter (US 4,111,717), Dschen (DE 41 10 653 A1), and Matarese (US 3,908,263) as applied to claims 67 and 88 above, and further in view of Grinberg *et al.* (US 4,922,116).

In regard to claims **74** and **75** (which are dependent on claim 67 in so far as understood) and claims **95** and **96** which are dependent on claim 88 in so far as understood, the modified method and apparatus of Peters *et al.* lacks a heat absorbent layer (*e.g.*, carbon) covering the upper surface of each of the ridges; and a heat reflecting layer (*e.g.*, a metal) covering the intermediate conductive surfaces between adjacent ridges. Baxter teaches (column 3, lines 46-55) to provide a reflective area (*e.g.*, gold) overlying a portion of the cold junctions in order to reduce the influence of stray radiation on the cold junctions. Grinberg *et al.* teach (column 9, lines 60-64; column 11, lines 35-38) that the upper surface of the bridges is covered with a heat-absorbent layer (*e.g.*, carbon black, metallic gold black, or black paint) in order to increase the temperature variation. Therefore, it would have been obvious to one having ordinary skill to provide a heat-absorbent layer on upper surface of respective conductive ridges and heat-reflecting layer on the cold junctions at intermediate conductive surfaces in the modified method and apparatus of Peters *et al.*, in order to reduce the influence of stray radiation and increase the temperature variation as taught by Baxter and Grinberg *et al.*

Response to Arguments

17. Applicant's arguments with respect to claims 55-101 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (703) 308-4881. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878

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September 5, 2002